

FEDERAL BUREAU OF INVESTIGATION
SCIENCE & TECHNOLOGY BRANCH
CRIMINAL JUSTICE INFORMATION SERVICES DIVISION

BIOMETRIC CENTER OF EXCELLENCE (BCOE)

IBPC 2016

Advancing Biometrics: Aims and Ambitions for the FBI's Biometric Center of Excellence

BCOE Mission

"To foster collaboration, improve information sharing, and advance the adoption of biometric and identity management solutions within the FBI and across the criminal justice and national security communities."

foster collaboration

improve information sharing

advance adoption

BCOE Focus

- Biometric Standards, Specifications, and Interoperability
- Biometric Prototypes, Pilots, and Toolsets
- Research and Development

Partnerships

- National Institute of Standards and Technology (NIST)
  - The BCOE manages the FBI's Interagency Agreement with NIST to receive vital support with research, development, and testing of biometric standards and technology. The BCOE currently partners with NIST on 10 projects.
- West Virginia University Cooperative Agreement
  - The BCOE maintains a Cooperative Agreement (CA) with the West Virginia University (WVU), who serves as a research portal to the academic world. The CA supports a direct relationship with the WVU, and indirectly links the BCOE to academic institutions across the nation.
- Center for Identification Technology Research (CITeR)
  - The BCOE is a member of CITeR. This is a National Science Foundation Industry/ Cooperative Research Center focusing on the areas of biometric identification and credibility assessment technologies. WVU is their lead site, giving access to several other academic institutions for research support.

- Biometric Technology Center (BTC)
  - Located on the current CJIS Division campus, the BTC is positioned within the state as a hub for technology in general and biometrics more specifically. The DoD is moving its Clarksburg operations into the joint BTC.

Electronic Biometric Transmission Specification (EBTS)

EBTS benefits federal, state, local, tribal, and international stakeholders with:

- *Consistent Communication*
  Users communicate with FBI systems using well-defined, interoperable messages which support a multitude of operations.
- *Increased Cooperation*
  Biometric and biographic identity information may be shared with authorized agencies.
- *Enhanced Electronic Submission*
  New message structures provide the ability to send high-resolution fingerprint, palm, face, tattoo, and iris images.

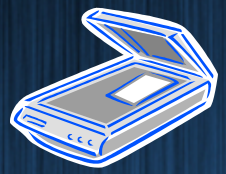
The EBTS and other FBI-sponsored standards are publically available online.

https://www.fbibiospecs.cjis.gov

Certified Products List (CPL)

Certifiable Products

[Fingerprint Printer & Software



Card Scanner & Software

[Fingerprint] Scanners

Live Scanner & Mobile ID

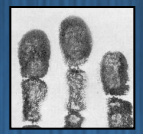
Fingerprint Outputs or Inputs

Ten-prints (card/paper) [& palmprints]

Ten-prints (card/paper) [& palmprints]

Ten-prints [& palmprints]

Plain prints only [& palmprints]



Variable number of fingers

Single finger

- 708 Certifications Received to Date

Compression Standards

500ppi

1000ppi

- Wavelet Scalar Quantization (WSQ) –
  - Compression algorithm for 500ppi submissions
  - Target compression ration: 15:1
  - Certified algorithms can be located at: http://fbibiospecs.cjis.gov
- JPEG 2000
  - Compression algorithm for 1000ppi submissions
  - Ten print target compression ration: 10:1
  - Lossless compression for latent images
  - NIST SP 500-300 (certification guidelines for JPEG 2000) ~ Posted 5/21/16

FBI Biometric Specifications (fbibiospecs) Web Site

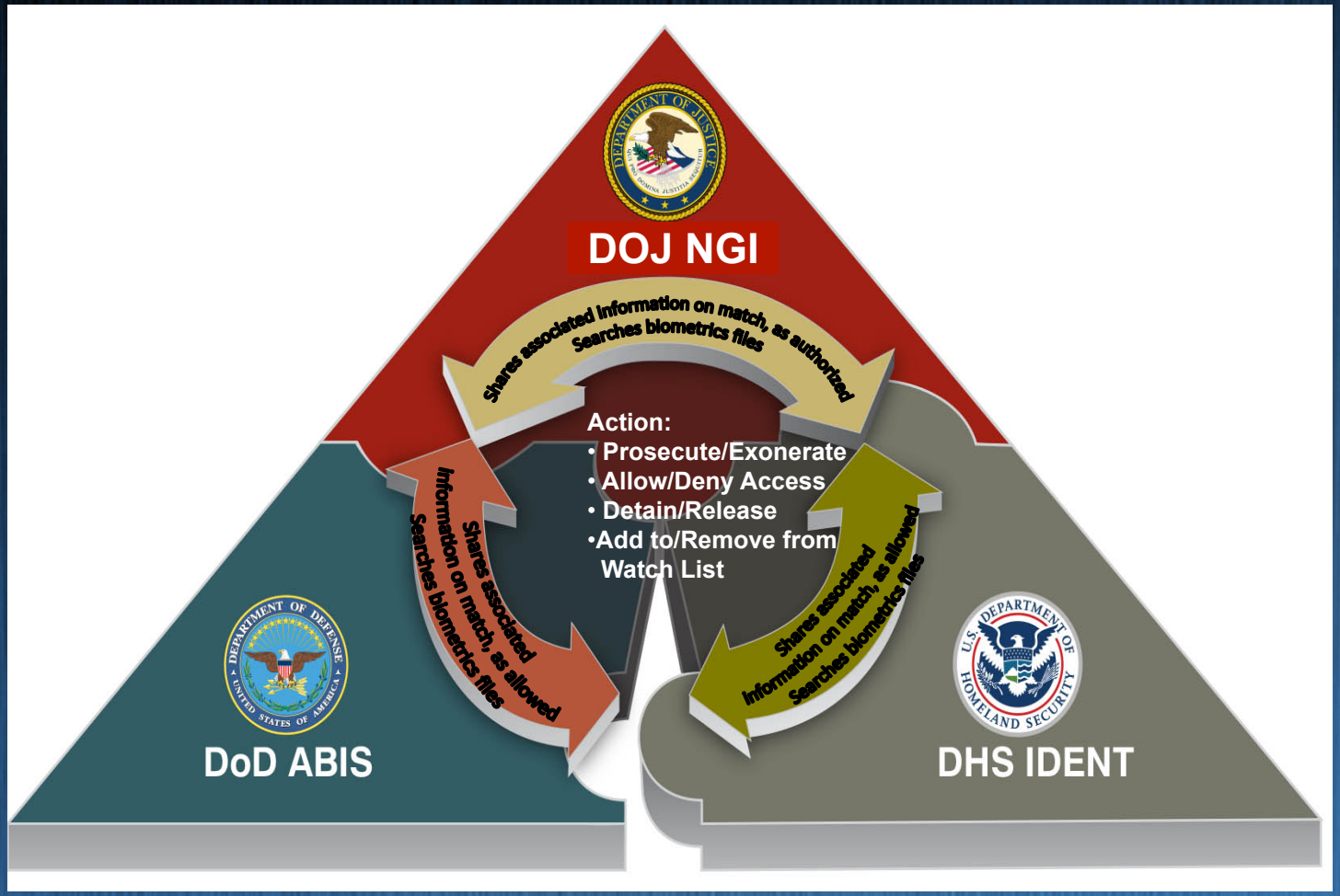
FBIBioSpecs provides access to beneficial biometrics and standards-related information as well as information required for the successful transmission of biometric data to the FBI including:

https://www.fbibiospecs.cjis.gov

- Electronic Biometric Transmission Specification (EBTS)
- Certified Products List (CPL)
- Compression Information
- Fingerprint Standards
- Iris Pilot Information
- Latent Print Services
- Rapid DNA (R-DNA) Guidance

The BCOE manages the FBIBioSpecs Web Site providing the most up-to-date information on biometric standards and best practices.

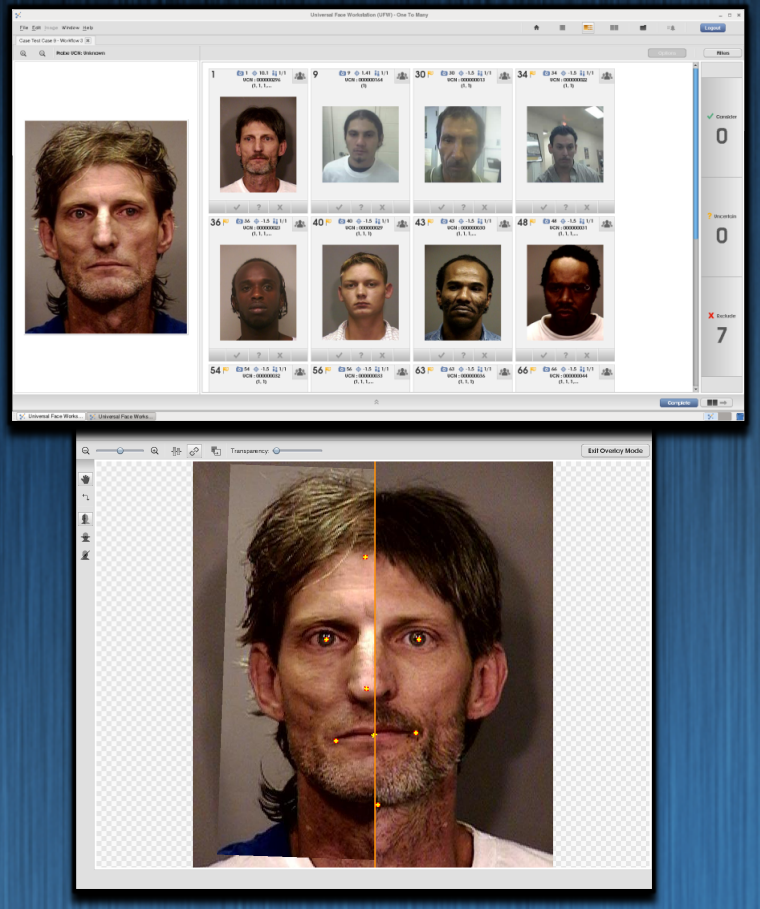
Interoperability



Universal Face Workstation (UFW)

BCOE software to support access to Next Generation Identification (NGI) System search capabilities:

- Search preparation, submission and candidate list review
- One-to-one examination screen
- Generates potential investigative leads based on examiner review

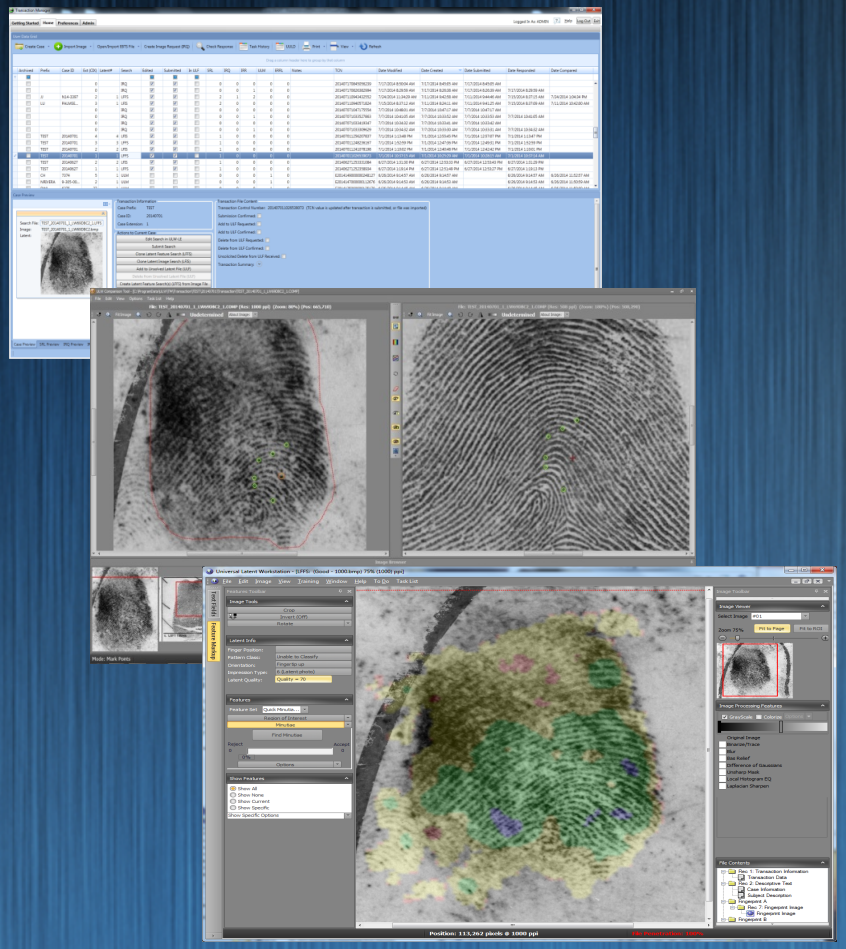


Available for authorized law enforcement use.

Universal Latent Workstation (ULW)

The ULW is the new generation of interoperable and interactive software for latent print examiners:

- Next step towards total standards-based workstations
- Provides the ability to search various Automated Fingerprint Identification Systems and the FBI's NGI with a single encoding leveraging the extended feature set
- Latent Quality Metrics
- 98% of external transactions sent to NGI are generated using ULW software



Iris Recognition Pilot

Concept:

- Build a nationally available iris image repository.
- Provide a high performance iris matching service.
- Develop standards for iris capture and transmission.
- Evaluate iris operations in realistic "large-scale" environment.

Participants:

- Texas Department of Public Safety
- California Department of Justice
- Missouri State Highway Patrol
- US Border Patrol
- Joint Automated Booking System
- Department of Defense

- *426,253 iris enrollments during the life of the pilot.*
- *About 13,000 enrolled monthly*

Iris possesses vast potential; it's quick, clean, accurate, scalable, and enhances criminal justice capabilities.

Voice Technology Evaluation Project (VTEP)

Objectives:

- Determine the feasibility of voice as a biometric modality.
- Evaluate
  - Speaker recognition: One-to-One (1:1)
  - Investigative searching: One-to-Many (1:N)
  - Diarization (voice segmentation)

Applied Outcomes:

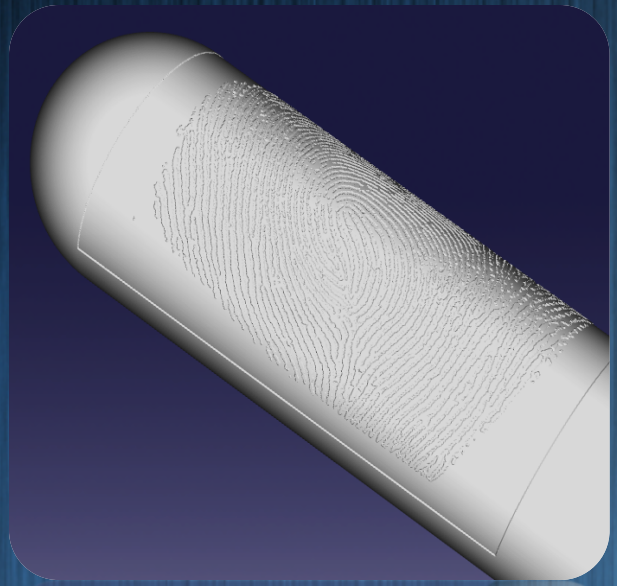
- Determine the accuracy and scalability of voice capabilities within private industry, government, and academia.
- Establish standards and best practices for capturing, transmitting, and processing voice information.

Voice offers a wealth of opportunity to identify terrorists and criminals.

Contactless Fingerprint Technology

Contactless fingerprint scanning technologies offer <u>future potential advantages</u>:

- Higher quality fingerprint images
- Faster capture times
- Unattended fingerprint collection
- Reduced likelihood of contaminant spread among subjects



NIST - Contactless Fingerprint Capture Device Measurement Research Program:

- Objective to produce open testing methods, metrics, and artifacts
- Access to devices via Cooperative Research and Development Agreement (CRADA)
- Supports future certification of devices for inclusion on Government CPL

CRADA participation inquiries and questions may be submitted to fastcap@nist.gov

Scars, Marks, Tattoos, and Symbols Technology (SMTS)

Objectives:

- Collaborative effort with National Institute of Standards & Technology (NIST)
- Evaluate current technology to advance image-based tattoo matching
- NIST Tattoo Challenge (Tatt-C) Key Focus Areas:
  - Detection
  - Similarity
  - Identification
  - Region-of-Interest Based Matching
  - Mixed Media Recognition

Tatt-C Tattoo Recognition Technology

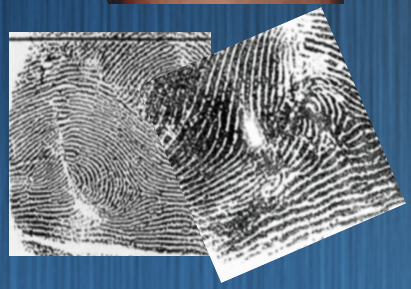
Applied Outcomes:

- Tattoo Identification: Developing investigative leads
- Hybrid Image and Text Recognition: Advance techniques that use both image and text to boost tattoo recognition

The BCOE is committed to evaluating and enhancing SMTS capabilities across the criminal justice community.

Emerging Possibilities

- Media Processing Framework
- Defensive Biometrics
- Face Aging
- Down Sampling
- Advancing Face Capabilities
- Profile and Ear Recognition Technology
- Lights Out Latent



Questions/Comments

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